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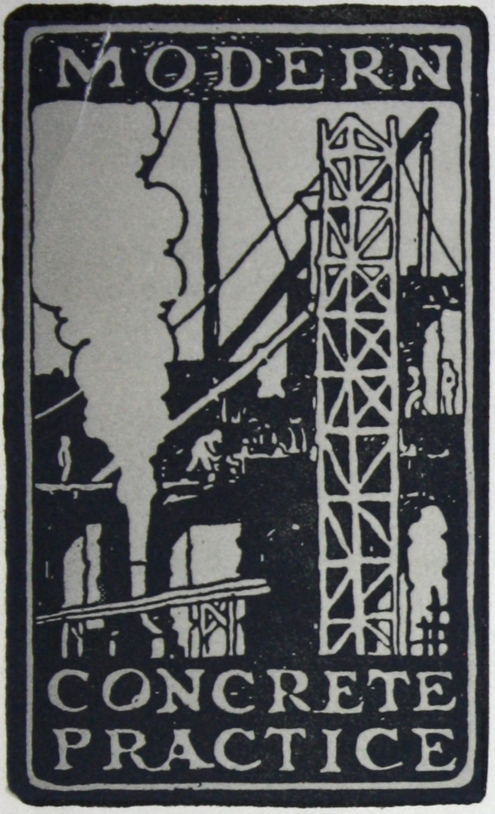

# *Why*

# SUMMER CONCRETING

# *Needs*

# CAL

*Reprint from Our*
*Architects Loose Leaf Catalog*

NET 99 LBS. GROSS 100 LBS.
AN APPROVED MATERIAL FOR CONTROLLING THE SET AND INCREASING THE
EARLY STRENGTH
OF PORTLAND CEMENT MIXTURES
CAL
"CAL CURES CONCRETE"
DIRECTIONS
SECURITY CEMENT & LIME CO.
HAGERSTOWN, MD.

**Security Cement and Lime Company**
**Hagerstown, Md.**

*New York*
**30 E. 42d. Street**

*Baltimore*
**Citizen's Nat'l**
**Bank Building**

*Washington*
**Colorado**
**Building**

*Chicago*
**327 S. LaSalle St.**

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# *Why Summer Concreting NEEDS CAL*

Architects and engineers make a practice of specifying that exposed surfaces of concrete, stucco, granolithic, etc., shall be kept wet, and protected from the direct rays of the sun for from ten days to two weeks after placing, and that brick shall be thoroughly soaked before laying. But these precautions are not always practicable, and where practicable they are very often neglected.

The United States Bureau of Standards, in investigating Cal, discovered that this material had great importance as an aid to proper curing of concrete under "rapid drying out conditions." In the Government tests the specimens were stored in the air of the laboratories instead of in a moist chamber or under water as in the usual practice in laboratory tests. Thus the conditions of storage were similar to the average condition of the summer-time job. The report, Technologic Paper 174, says,

"The effect of Cal under the conditions of these tests is remarkable. The strength of the treated mortar at 2 days is considerably above that of the untreated mortar at 28 days." (see Fig. 1)

Soft concrete and mortar, dusty floors, checking and cracking, streaks of rust from reinforcements near the surface, spalling of surfaces, are failings which have been all too common in the past. With the advance of the art of using Portland cement the causes of these imperfections have been run to earth, and architects, engineers and contractors have been quick to realize that the making of "Concrete for Permanence" is a real art and is dependent on more than the adding of a lot of water to sand, stone, and cement.

Contractors have long since found out the difficulties of cold weather work, when without special precautions cement is very slow in setting and strengthening and there

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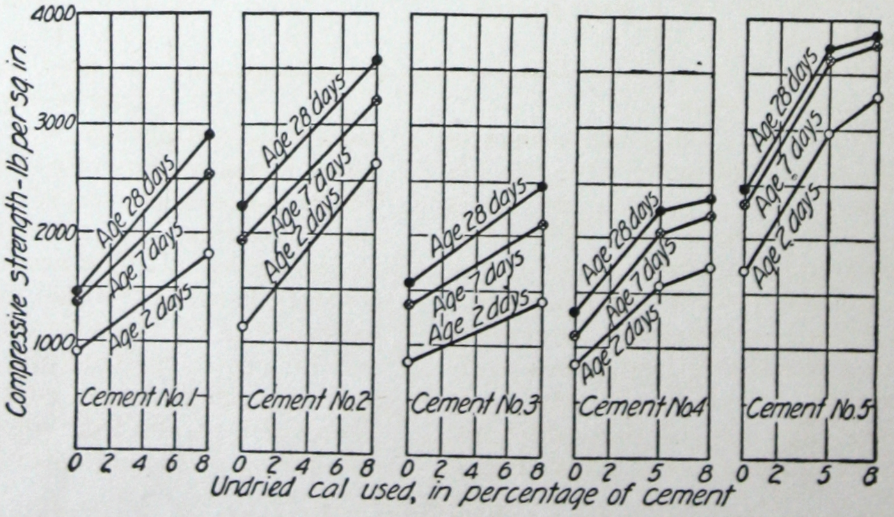

Fig. 1 Compressive strength of mortar at various ages treated with Cal and stored in air.
(From Tech. Paper 174 U. S. Bureau of Standards)

# *Summer Concreting*

(CONTINUED)

is always a chance of frozen concrete and disastrous collapses. They have learned to heat water and aggregates in order to speed up the initial set, and to add an accelerating compound to further hasten the hardening so that it is now possible to approach normal speed in winter work, and to avoid danger of freezing.*

But the summer-time dangers are more insidious and are therefore less generally recognized. The imperfections mentioned above are in the majority of cases due to "rapid drying out conditions" when sun and wind evaporate the water from the concrete or mortar before the cement has gained its full strength.

The setting and strengthening of Portland Cement is a chemical reaction between water and cement. Water is absolutely necessary for this strengthening. The reaction extends over a period of many weeks but the strength at twenty-eight days is considered as the ultimate strength on which, with factors of safety, the loads for the structure are based. When untreated concrete is exposed too soon to the sun and wind, the water which is necessary for the reaction is stolen away by evaporation so that the strengthening process is stopped, and the remaining concrete is soft and porous. The loss of this water not only deprives the concrete of a very necessary ingredient but it leaves voids which weaken its ability to stand external loads, and which give easy access to rain and frost.

## Laboratory *vs.* Job

**Laboratory tests under standard conditions are valuable for indicating general tendencies and for determining ideal methods. While these conditions are sought in actual practice, it is impossible to duplicate them exactly. The most important point of difference is the condition of curing.**

**The great majority of all concrete on the job is cured in a drying out atmosphere, as opposed to the moist chamber storage of laboratory specimens.**

**Many tests have been made on Cal concrete and mortar stored in ordinary air, and *IN EVERY SERIES OF TESTS UNDER THESE CONDITIONS THE 28-DAY STRENGTH OF THE CAL SPECIMENS HAS BEEN GREATER THAN THAT OF THE PLAIN.***

Reinforcements near the surface of "dried out" concrete are almost invariably subject to corrosion, because the concrete is porous enough to allow rapid absorption of water. Rust occupies twice the space occupied by the iron or steel from which it is formed, and thus corrosion causes enormous pressure from within to crack the concrete.

Another evidence of the same trouble is frequently found in mortar joints of brick work, which are soft and loose. In this case the brick itself has taken the place of the sun in sucking the life out of the mortar.

"Cal Cures Concrete" is more than a slogan. It is a fact which is based on the highest type of scientific work by recognized authorities, and on many jobs where it has demonstrated its curing value. Cal resists evaporation of water from the green concrete, but gives up this water to the cement as it is needed. When the concrete hardens the fine particles of anhydrous Cal fill the voids, making a dense and impermeable structure, and thereby reducing expansion and contraction in service, which results from alternate wetting and drying of the old concrete.

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*Information on the winterproofing action of Cal will be sent by the Security Cement & Lime Co. on request.

SECURITY CEMENT & LIME CO., HAGERSTOWN, MD. E-5-1924

# *Directions for Waterproofing and Curing with Cal*

For waterproofing and curing concrete and mortar with Cal simply incorporate in your standard specifications the words, "All concrete and mortar on this job (or on specified portions of the job) shall be waterproofed by the introduction of three to five pounds* of Cal for each bag of Portland cement. The Cal shall be added dry to the mix at the same time as the cement and aggregates."

The makers of Cal cannot urge too strongly the importance of thorough mixing and of a low water cement ratio. These are well recognized principles for the production of good concrete and Cal should never be substituted for careful attention to these requirements.

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*Ordinarily five pounds of Cal should be specified, although in 1:2:4 and richer mixes three pounds is sufficient where the drying out conditions are not severe.

For the "same strength in half the time" always specify five pounds until trial on the job has shown satisfactory results with less.

## We Quote

| | |
|---|---|
| **Less than ton lots** | **4c lb.** |
| **Ton lots, less than five tons** | **3c lb.** |
| **Five ton lots, less than twenty-five tons** | **2¾c lb.** |
| **Twenty-five ton carlots** | **2½c lb.** |

**All prices f. o. b. factory, Berkeley, W. Va.**

***Subject to change without notice***

**Official Freight Classification LCL R26, CL 5th Class**

Cement Dealers charge these prices plus
actual freight and handling costs.

**Stocks in principal cities. Name of distributor on request.**

A LITTLE MORE COST—
A LOT BETTER JOB

| | |
|---|---|
| Less carlots . . . . . | 2¾c. lb. |
| Less than ton lots | 3 c. lb. |

Carlot prices on request

*All prices f. o. b. factory Berkeley*
*West Virginia*

Cement dealers charge these prices
actual freight and handling costs

See Cal pages 108—109 Sweet's
Architectural Catalog, 18th Edition.

E—45—1924

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